

# Stefano Colafranceschi

CERN, European Organization for Nuclear Research  
Route de Meyrin  
CH-1211 Geneva  
Switzerland

Physics Department (PH)  
Tel: +41 76 487 2881  
Fax: +41 22 76 78940  
email: [stefano.colafranceschi@cern.ch](mailto:stefano.colafranceschi@cern.ch)

*Home Address:*  
53, Rue du Fort  
01550 Collonges  
France

Tel: +33 9 54 29 07 25  
Mob. (CH): +41 76 487 2881  
Mob. (FR): +33 68 301 0774

Born: 9 August 1982, Rome, Italy  
Nationality: Italian — Gender: Male

## Current position

*PhD Student*, Università degli studi di Roma - La Sapienza, Dipartimento Chimica Materiali Ambiente, Rome, Italy, and CERN Doctoral Student, Geneva, Switzerland.

## Areas of specialization

Gaseous Detectors, Gas systems and analysis, DAQ and monitoring systems.

## Areas of competence

Software Development, data monitoring and analysis, computing, Mechanical Engineering, running detector laboratory.

## Education

Oct 2008 - present **PhD in applied engineering**  
*"A study of materials used for muon chambers at the CMS Experiment at the LHC: interaction with gas, new materials and new technologies for detector upgrade"*  
ADVISORS: Dr. Archana Sharma(CERN), Dr. Stefano Bianco(INFN), Dr. Giovanna Saviano(Sapienza)  
*Università degli studi di Roma - "La Sapienza", Facoltà di Ingegneria, Rome, Italy*  
*expected date: December 2011*

2005-2008 **MSc in Astronautic Engineering**  
*"Development of fiber optic sapphire sensor for aerospace applications and for the CMS Experiment"*  
ADVISORS: Prof. Antonio Paolozzi(Sapienza), Prof. Fernando Felli(Sapienza), Dr. Stefano Bianco(INFN)  
*Università degli studi di Roma - "La Sapienza", Scuola di Ingegneria Aerospaziale, Rome, Italy*  
Mark: 103/110

2001-2005

**BSc in Aerospace Engineering**

*"Failure of the shuttle Columbia in 2001"*

ADVISORS: Prof. G. Coppotelli (Sapienza)

*Università degli studi di Roma - "La Sapienza", Facoltà di Ingegneria, Rome, Italy*

## Work Experience

2008-now

**CERN, European Organization for Nuclear Research**, Geneva, Switzerland

*PhD student*

Working for the RPC muon system of the CMS Experiment on the characterization of RPC detector behavior along with different gas purifier configurations. Working on new prototypes construction, test beam planning and operation, data analysis within the GEMs for CMS collaboration.

2008-now

**Technological Associate to LNF - INFN within the CMS group**, Rome, Italy

*Software Developer*

Working for the Gas Gain Monitoring System (GGM), an online monitoring of the gas quality at the CMS Experiment.

2007-2008

**CERN, European Organization for Nuclear Research**, Geneva, Switzerland

*Technical student*

Working on RPC detectors within the ATLAS-CMS gas task force group, construction, assembly, QC of RPCs.

Jun-Sep

2007

**CERN - CMS Experiment**, Geneva, Switzerland

*INFN Internship*

Development an acquisition system for "Gas Gain Monitoring System" located at CERN-ISR.

2004-2007

**CERN - CMS Experiment**, Geneva, Switzerland

*Software Developer*

Development of various kinds of software, from modelling 3D finite elements in free molecular flow to data digitalization.

## Languages

*Italian* (native speaker)

*French* (spoken)

*English* (fluent)

# Skills

## 1. Programming Languages

### C++

Very good knowledge,  
Used in data-analysis and software development for DAQs systems.

### Fortran

Very Good knowledge,  
Used during the MSc Thesis work, to perform data analysis programs.

### Matlab

Good knowledge,  
Used for data-analysis, in particular for the development of neural networks.

### Visual BASIC.

Good knowledge,  
Used to develop GUI for Windows applications.

### LabView.

Good knowledge,  
Used for readout sensors and small DAQ systems.

Markup languages: **XML**, **Wiki**, **HTML+CSS**. Good knowledge.

Typesetting languages: **LaTeX**, **XeTeX**. Very good knowledge.

## 2. Physics Packages

### ROOT Analysis Framework

Very good Knowledge  
Used in several DAQ system and data-analysis frameworks.

### ANSYS

Good knowledge  
Used in several application such as thermal and fluid-dynamics simulations.

## 3. Operating Systems

### Linux

Very good knowledge, also as *Administrator* (especially SLC, RedHat, Debian, Ubuntu, Fedora.)

### Windows

Very good knowledge, also as *Administrator*: Vista, XP, 9X, 3.X, MS-DOS.

### Apple Os X

Good knowledge: All versions.

#### 4. Other IT-related skills

Good knowledge of DAQ frameworks like **XDAQ**.

Good knowledge of build tools like **make**.

Good knowledge of **SubVersion** version control system, also as *Administrator* (GGM repository software).

Good knowledge of the **Eclipse IDE** as multi-language development framework.

Good Knowledge of **AFS file system**, **NFS file system** and basic knowledge of **Kerberos**.

**CMS – Content Management Systems**: Good Knowledge of **Joomla** administration and customization. Basic knowledge of **Wordpress**

**OS and Computer Architecture**: Good Knowledge of computer architecture theory and Operating System architectures, and implications in software programming techniques (pipelines, buffers, caches, I/O, multithreading, ...).

Very good knowledge of the **Hardware** Market, and good skills in assembling machines.

I maintain and manage engineering computers of our group and laboratory.

## Work experience in large experiments and Collaborations

### CMS Experiment

**Data Analysis** RPC-ISR data-taking focused on CMS-RPC muon chambers and "GEMs for CMS" test beams data-taking for testing new muon detectors prototypes.

**Development & Upgrade** Working in the GEMs for CMS collaboration, on the upgrade of the high-eta project.

**Detector Operation** Shifter in the control room as RPC Operation Manager.

**Documentation** Responsible person for the GGM documentation hardware and software.

## Publications and talks

### 1. Publications

*'Sensitivity and environmental response of the CMS RPC gas gain monitoring system'*

L. Benussi, *et al.*

*JINST* 4 P08006 doi: 10.1088/1748-0221/4/08/P08006

*'Operational experience of the gas gain monitoring system of the CMS RPC muon detectors'*

D. Abbaneo, *et al.*

*Nuclear Instruments and Methods in Physics Research, A* 617 (2010) 146-147

*‘Construction of the first full-size GEM-based prototype for the CMS high- $\eta$  muon system’*

D. Abbaneo, *et al.*

*IEEE proceeding*, 10.1109/NSSMIC.2010.5874107

*‘Characterization of GEM Detectors for Application in the CMS Muon Detection System’*

D. Abbaneo, *et al.*

*IEEE proceeding*, 10.1109/NSSMIC.2010.5874006

*‘A new approach in modeling the response of RPC detectors’*

L. Benussi, *et al.*

*Nuclear Instruments and Methods in Physics Research*, 10.1016/j.nima.2010.09.172

*‘An Investigation of the dependence of CMS RPC operation on environmental parameters’*

Y. Assran, *et al.*

*Nuclear Physics B - Proceedings Supplements Volume 215, Issue 1, June 2011, Pages 353-355*

*‘Study of gas purifiers for the CMS RPC detector’*,

L. Benussi, *et al.*

*Nuclear Instruments and Methods in Physics Research*, doi:10.1016/j.nima.2010.08.089

## **2. CERN internal notes**

*‘Studies of materials used in the CMS closed loop gas system for the CMS RPC detector loop’*,

S. Bianco, *et al.*

CMS IN -2008/047

CERN, Geneva, Sep. 2008

*‘Chemical analyses of materials used in the CMS RPC muon detector’*,

S. Bianco, *et al.*

CERN-CMS-NOTE-2010-006

CERN, Geneva, Aug. 2009

*‘A new approach in modeling the response of RPC detectors’*,

L. Benussi, *et al.*

CERN-CMS-NOTE-2010-009

CERN, Geneva, Feb. 2010

## **International conferences**

22.09.2008

27.09.2008

**SIF2008** - XCIV Congresso Nazionale Società Italiana Fisica,

*‘Gas purification studies and a gas gain monitoring system for the RPC muon detector of the CMS experiment at the CERN Large Hadron Collider’*

Talk on behalf of the CMS Collaboration

Genova, Italy.

22-10.2008

28.10.2008

**IEEEo8** - 2008 IEEE Nuclear Science Symposium and Medical Imaging Conference,

*‘Sensitivity and environmental response of the CMS RPC Gas Gain Monitoring system’*

Talk on behalf of the CMS Collaboration

Dresden, Germany.

- 24-05.2009  
30.05.2009 **Frontiers Detectors for Frontier Physics** - 11th Pisa meeting on advanced detectors,  
*"Operational Experience of the Gas Gain Monitoring System of the CMS RPC muon detectors"*  
Poster on behalf of the CMS Collaboration  
La Biodola - Isola d'Elba, Italy.
- 28.09.2009  
3.10.2009 **SIF2009** - XCV Congresso Nazionale Società Italiana Fisica,  
*"Studio dei contaminanti al sistema di test del ricircolo Closed Loop del rivelatore per muoni RPC di CMS ad LHC"*  
Talk on behalf of the CMS Collaboration  
Bari, Italy.
- 09.02.2010  
13.02.2010 **RPC2010** - Resistive Plate Counters 2010,  
*"A new approach in modeling the behavior of RPC detectors"*  
Talk on behalf of the CMS Collaboration  
Darmstadt, Germany.
- 30.10.2010  
06-11.2010 **IEEE2010** - 2010 IEEE Nuclear Science Symposium and Medical Imaging Conference,  
*"Gas Simulations for Gaseous detectors"*  
Poster about my own work  
Knoxville, USA.

## Other attended conferences

- 08-10.2007  
13.10.2007 **HADRON09** - XII Conference on Hadron Spectroscopy,  
Frascati, Italy.
- 25.10.2009  
31.10.2009 **IEEE09** - 2009 IEEE Nuclear Science Symposium and Medical Imaging Conference,  
Orlando, USA.
- 11-10.2010  
15.10.2010 **HQL2010** - Heavy quarks and leptons,  
Frascati, Italy.

## Talks in workshops

- 2007 *CMS RPC Gas gain monitoring system*  
RPCITALIA, CERN, Geneve (Switzerland)
- 2009 *Status of gas gain monitoring system for CMS RPC*  
CERN, Geneve (Switzerland)
- 13.08.2009 *CMS RPC studies at CERN*  
RPCITALIA, Ischia, (Italy)
- 2009 *Performance of small MPGD prototype*  
RD51 week, CERN, Geneve (Switzerland)

- 2010 *Performance of small MPGD prototype*  
RD51 week, CERN, Geneve (Switzerland)
- 05.02.2011 *GEMs Detectors at CMS*  
CBM-MUCH, GSI, Darmstadt (Germany)
- 24..05.2010  
27.05.2010 *"Gas flow simulations"*  
RD51 week, Freiburg, (Germany).
- 17.01.2011 *"Results from the TestBeam"*  
RD51 week, Talk about my own work  
Geneve, (Switzerland.)

## Talks at CMS weeks

- 02.2008 *The Gas Gain Monitoring system*,  
CERN, Geneve (Switzerland).
- 12.2008 *Status of ISR tests*,  
CERN, Geneve (Switzerland).
- 03.2009 *The Gas Gain Monitoring Status Status*,  
CERN, Geneve (Switzerland).
- 12.2009 *CMS RPC closed loop studies at ISR*,  
CERN, Geneve (Switzerland).

## Teaching

- 2008-2011 Supervisor of a several CERN summer student for short-term projects,  
CERN, Geneva, Switzerland.

### 3. Academical and Technical training

- 2009 *"The PVSS- $\mathcal{J}$ COP framework"*,  
CERN, Geneva, Switzerland.
- 2010 *"Excellence in Detectors and Instrumentation Technologies"*,  
CERN, Geneva, Switzerland.